

REMARKS/ARGUMENTS

Claims 1-28 are active in this case. Claims 17-26 have been withdrawn due to the Office's Restriction Requirement. Applicants request rejoinder of these non-elected claims upon finding that the elected claims are allowable (noting that the non-elected claims depend from the elected claims).

Support for the amendment to Claim 1 is found in Figure 1 and page 4, 1<sup>st</sup> paragraph; and page 5, lines 26-27. Support for the amendment to Claim 9 is found on page 4, lines 22-24, page 5, lines 8-10 and Figure 2 Claim 28 finds support in Claim 14, which obviates the issues raised under 112, second paragraph. Claim 12 has been amended to correct the typographical error noted by the Office on page 2 of the Action.

No new matter is believed to have been added by these amendments.

Claims 1-6, 12-16 and 27 have been rejected under 35 USC 102(b) in view of seven publications. For the reasons that follow, the device as now claimed is not anticipated by the disclosures of any of these seven publications.

Before addressing each of the rejections in substance, it is worthwhile to explain the invention in terms of its arrangement and advantages. As discussed on page 3 of the present specification:

Surprisingly, it has been found that a solid (B) can be produced in lump form with a relatively low production of silicon dust in a simple and particularly economic way by controlled thermal decomposition of a gaseous substance (A) if the decomposition and deposition of the substance (A) is carried out in a specific device.

This specific device mentioned in this paragraph, is the one that is claimed.

Moreover, this device is particularly advantageous for producing polycrystalline silicone (as the

solid (B) in the paragraph above—see page 4, 1<sup>st</sup> paragraph of the specification) from silane gases, see also page 4, 2<sup>nd</sup> paragraph (reproduced below):

The present invention is particularly economical, since the outlay on equipment is relatively low, and when monosilane is used as substance (A) the only off-gas formed is hydrogen, possibly with small amounts of monosilane. In addition, a relatively low level of silicon dust is formed in the process. Due to the procedure and device according to the present invention, there is generally no caking of solid (B) on the reactor wall (3). Furthermore, practically the only off-gas obtained is free hydrogen. The deposition rate of solid (B) is generally >97%. Furthermore, the dust content in the off-gas (C) after outlet (3.6) is generally very low. Also, the present process is particularly advantageous in energy terms, since, inter alia, relatively low substance flow rates can be used.

The devices described in the cited references are arranged in a manner that is different from that claimed. Moreover, those devices because they are designed and optimized for specific purposes other than the preparation of polycrystalline silicon as described in this application would not have been modified to yield the claimed device.

(1) U.S. Patent No. 5,735,960 describes a chemical vapor deposition reactor. The reactor includes a cup-like structure having a series of perforations (12) (see column 3, lines 53-54 and Figure 1). As discussed in col. 5, lines 32-35, these perforations are needed to “create desired pressure and temperature conditions where the plasma is to be created. This patent does not describe a device which includes a cup with solid walls and a base comprised of a silicon substrate suitable for the deposition of polycrystalline silicone. Accordingly, Applicants request that the rejection under 35 USC 102(b) based on this reference be withdrawn.

(2) U.S. Patent No. 5,604,151 describes a chemical vapor deposition reactor for producing silicon carbide with walls made of silicon carbide and a gas injecting device (22) with a series of baffles 24 “used to control the aerodynamics of gas flow through the furnace

10 (see Figure 1 and column 3, lines 39-60). This patent does not describe or suggest that the walls of the cup relative to the base of the cup are such that the external diameter of the walls of said cup is less than or equal to a diameter of said base. Furthermore, this patent does not describe a device including a cup with a flat base comprised of a silicon substrate suitable for the deposition of polycrystalline silicone. Accordingly, Applicants request that the rejection under 35 USC 102(b) based on this reference be withdrawn.

(3) U.S. Patent No. 5,565,248 describes plasma deposition on a hollow container with, for example, silica or insoluble metal oxides (see column 2, lines 43-51). The techniques, and therefore the devices used, in this patent are for coating the inner surface of plastic or metal containers (see col. 2, lines 28-30). Moreover, according to the patent in col. 2, lines 51-55: “[t]o enable coating of heat sensitive plastic containers with coating materials which can only be vaporized at very high temperatures, the invention provides for coating without unacceptable increase in plastic substrate surface temperature.” This patent does not describe a device including a cup with a flat base comprised of a silicon substrate suitable for the deposition of polycrystalline silicone. Accordingly, Applicants request that the rejection under 35 USC 102(b) based on this reference be withdrawn.

(4) U.S. Patent No. 5,521,351 describes plasma deposition in a container (see Figure 1, column 4, line 56 to column 5, line 27). The types of gases which can be added to this reactor are set forth in column 6, Table 1. As with the ‘248 patent discussed immediately above, the ‘351 patent also seeks to use plasma, RF induction, processes for providing a coating or thin film on the interior of some container, e.g., a hollow dielectric form (see (col. 2, lines 53-56). This patent does not describe a device including a cup with a flat base comprised of a silicon substrate suitable for the deposition of polycrystalline silicone.

Accordingly, Applicants request that the rejection under 35 USC 102(b) based on this reference be withdrawn.

(5) U.S. Patent No. 4,207,360 describes a CVD process of producing silicon in a reactor of Figure 2 including a hollow chamber of which defined as feature (12). Notably, this chamber 12, as depicted in Figure 2 of the '360 patent includes a silicon product outlet 25 for removing the silicon particles created in the reactor (col. 4, lines 10-12). Therefore, this patent does not describe a device including a cup with a flat and solid base comprised of a silicon substrate suitable for the deposition of polycrystalline silicone. Accordingly, Applicants request that the rejection under 35 USC 102(b) based on this reference be withdrawn.

(6) U.S. Patent No. 4,147,571 describes vapor epitaxial deposition on a semiconductor substrate (17) (see column 3, lines 23-39) in a reactor (11) where gas is injected through ports 19 and 21 with exhaust through port 23. As depicted, the alleged feature which the Examiner has equated to the cup portion of the claimed device, i.e. reactor (11), encloses the substrate in a large space but does not describe or suggest that the walls of the cup relative to the base of the cup are such that the external diameter of the walls of said cup is less than or equal to a diameter of said base. Accordingly, Applicants request that the rejection under 35 USC 102(b) based on this reference be withdrawn.

(7) U.S. Patent No. 3,338,761 describes a cylindrical reactor with a bottom (14) supporting a substrate material (15) (see column 2, lines 53 – column 3, line 35). The patent also describe that the substrate material 15 is a gallium containing wafer (col. 4, lines 49-50). This patent does not describe or suggest that the walls of the cup relative to the base of the cup are such that the external diameter of the walls of said cup is less than or equal to a diameter of said base. Furthermore, this patent does not describe a device including a cup

with a flat and solid base comprised of a silicon substrate suitable for the deposition of polycrystalline silicone. Accordingly, Applicants request that the rejection under 35 USC 102(b) based on this reference be withdrawn.

The rejection of Claims 7-11 as being obvious in view of U.S. patent no. 5,735,960 and U.S. Patent Publication 2002/0122885 is respectfully traversed. The differences between the claimed device and the device described by the '960 patent are discussed in detail above. The '885 application describes a CVD apparatus in which some portions of the device are made of silicon. On this basis, the Examiner has alleged that it would have been obvious to substitute silicon for the explicit materials described in the '960 patent and it would have been obvious to optimize the dimensions of the container. Applicants disagree because there is simply no motivation to substitute any of the materials from the primary references with silicon as described in this patent publication. Moreover, there is nothing in any of the references which specifically suggest using quartz glass, metallic material, and/or high purity silicon in those devices because they are designed and optimized for specific purposes other than the preparation of polycrystalline silicon as described in this application. Still further, there is nothing in the '885 application which suggest or would have motivated one to modify the '960 patent device in such a dramatic fashion as to replace the required perforations of the '960 patent. Accordingly, withdrawal of this rejection is requested.

The rejection of Claims 7-9 as being obvious in view of U.S. patent no. 3,338,761 and the '885 application is respectfully traversed.

The differences between the claimed device and the device described by the '761 patent are discussed in detail above. In this rejection, the Examiner has once again alleged

that it would have been obvious to substitute silicon for the explicit materials described in the '761 patent and it would have obvious to optimize the dimensions of the container.

Applicants disagree because there is simply no motivation to substitute any of the materials from the primary references with silicon as described in this patent publication. Moreover, there is nothing in any of the references which specifically suggest using quartz glass, metallic material, and/or high purity silicon in those devices because they are designed and optimized for specific purposes other than the preparation of polycrystalline silicon as described in this application. Still further, there is nothing in the '885 application which suggest or would have motivated one to modify the '151 patent device in such a dramatic fashion as to replace the required materials of silicon carbide with material suitable for the deposition of polycrystalline silicone or go significantly astray from the '151 patent required device configuration such that the walls of the cup relative to the base of the cup are such that the external diameter of the walls of said cup is less than or equal to a diameter of said base. Accordingly, withdrawal of this rejection is requested.

The rejection of Claims 8, 10, and 11 as being obvious in view of U.S. patent no. 5,735,960, the '885 application and U.S. patent no. 4,207,360 is respectfully traversed.

The differences between the claimed device and the device described by the '960 patent are discussed in detail above. In this rejection, the Examiner has once again alleged that it would have been obvious to substitute silicon for the explicit materials described in the '761 patent and it would have obvious to optimize the dimensions of the container. Applicants disagree because there is simply no motivation to substitute any of the materials from the primary references with silicon as described in this patent publication. Moreover, there is nothing in any of the references which specifically suggest using quartz glass,

metallic material, and/or high purity silicon in those devices because they are designed and optimized for specific purposes other than the preparation of polycrystalline silicon as described in this application. Still further, there is nothing in the '885 application nor the '360 patent which suggest or would have motivated one to modify the '960 patent device in such a dramatic fashion as to replace the required perforations of the '960 patent. Accordingly, withdrawal of this rejection is requested.

The rejection of Claims 8, 10, and 11 as being obvious in view of US patent no. 4,147,571, the '885 application and the '360 patent is respectfully traversed.

The differences between the claimed device and the device described by the '571 patent are discussed in detail above. Notably, as discussed above, the '571 patent does not describe or suggest that the walls of the cup relative to the base of the cup are such that the external diameter of the walls of said cup is less than or equal to a diameter of said base.

In this rejection, the Examiner has once again alleged that it would have been obvious to substitute silicon for the explicit materials described in the '571 patent and it would have been obvious to optimize the dimensions of the container. Applicants disagree because there is simply no motivation to substitute any of the materials from the primary references with silicon as described in this patent publication. Moreover, there is nothing in any of the references which specifically suggest using quartz glass, metallic material, and/or high purity silicon in those devices because they are designed and optimized for specific purposes other than the preparation of polycrystalline silicon as described in this application. Still further, there is nothing in the '885 application nor the '360 patent which suggest or would have motivated one to modify the '571 patent device in such a dramatic fashion as to reconfigure

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the device simply to “optimize the cup and base.” The ‘571 device is already optimized to the extent that the ‘571 patentees sought a patent for their devices and/or processes. The alleged modifications are nothing more than hindsight reconstruction of the claimed device, in that the motivation to alter the device is not found in the prior art. Moreover, as described in the specification and reproduced above, the claimed device facilitates a number of benefits and improvements from what had been described previously. Accordingly, the claims are patentable over the combination of these cited publications and withdrawal of this rejection is requested.

Allowance of all pending claims is requested.

Respectfully submitted,

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(OSMMN 06/04)